Patterns of multi-channel communication among older teens

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Sociology of the Mobile Phone

Patterns of multi-channel communication among older teens

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Abstract

Based on a study of 1440 Swiss teenagers in 2003, higly complementary (instead of substitutive) relationships are found between the usage of various technical communication media as well as between media usage and face-to-face interactions. Males seem particularly prone to use all media channels in a complementary fashion. Among both genders, there is a particularly strong complementarity between the fixed and the mobile phone. When partners meet rarely, the communicate more by written than by oral media, particularly by SMS. By comparing older acquaintances with more recently created interpersonal relationships, it is found that the mix of media channels doesn't change significantly over time, except that the exchange of Short Text Messages declines. While to closeness of a relationship seems to be positively affected by the frequency of meetings and fixed phone calls, mobile contacts and Emails don't seem to make any consistent contribution.

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"We often start with a text,
but if it gets too bad, then phone calls have to be made,
and if it gets worse, then we have to meet!"[1]

1. Introduction

The ever widening spectrum of technical communication media calls for highly complex conceptual and theoretical frameworks because substitutive as well as complementary relationships between the different media have to be considered.

The former are well illustrated by our daily habit to call even near neighbours by phone than knocking at their door, or by replacing former snail mail letters increasingly with Email messages or SMS.

Similarly, Squires has found in her study about college students that all technically mediated exchanges were low among people who met several times a day, while cell phone usage was highest among people with moderate offline contacts ("several times a week") and Email was almost exclusively used for partners met rarely face-to-face (a few times per month) (Squires 2004).

However, while new media may replace older ones in certain aspects, they predominantly complement them by offering new potentialities of interaction and togetherness as well as by adding new ways to realize and experience interpersonal relationships, group membership and organizational cooperation. For instance, research has shown that the rise of technically mediated communication channels has not diminished the strong need of adolescents for gathering physically and for keeping in contact by offline communication (Grinter and Eldridge 2003; Lenhart/Madden/Hitlin 2005).

As a consequence, modern sociology faces the challenge that least bilateral human relationships have nowadays to be understood and analyzed as complex multimedia processes combining primary face-to-face meetings with intermittent communication by fixed phone, mobile phone as well as various text, image and video messages by Email, SMS or Instant Messaging channels. (Squires 2004).
"Rather than being exclusively online or in-line, many community ties are complex dances of face-to-face encounters, scheduled meetings, two-person telephone calls, emails to one person or several, and broader online discussion among those sharing interests." (Wellman 2001: 237).

Thus, Rettie (2003) has come to the conclusion that
"Contrary to predictions, as technologies converge, with email and messaging being available on mobiles, and SMS and VOIP available on PCs, the different formats are likely to be retained because of their specific roles. Each of the four technologies researched has its own inherent advantages and different degrees of connection; these create specific roles and gratify different communication need." (Rettie 2003).

Apart from substituting or supplementing each other, it may well be that the new media have enriched the total sphere of interindividual exchanges because each mode constitutes a distinct "new way to experience communication" (Squires 2004).

In a study on college students, more than 61% of the respondents agreed with the statement that *“I get different aspects of people’s personalities depending on whether I am interacting with them through email, IM, or phone” (Squires 2004).*

[1] Dictum of an interview respondent, cited in Fox 2004.

This would indicate that media diversification is a way to enrich interpersonal relationships: by disclosing reciprocally a broader range of personal traits and responses and by cultivating a more diversified social exchange (by experiencing the partner as somebody who not only talks, but also writes texts, produces his own fotographs and videos, surprises with a call at night or early morning, who contacts me spontaneously from schoolrooms, workplaces, entertainment localities and various other circumstances etc. ...

The more all these media are at hand for everybody 24 hours a day, the less their usage is conditioned by any physical constraints, so that it is increasingly determined by personal decisions, social norms or cultural patterns.

Personal decisions:
On a first, most elementary level, we have to explain media usage as a consequence of individual choice guided by subjective interpretations, goals and preferences.
During daily life, individuals constantly make decisions whether they use medium A, B. or C for just "keeping in touch" with somebody, discuss a specific topic or transmit a specific information.
In order to explain these choices, social science needs to understand the functional capacities, impacts and limits of different media under various conditions of individual and social life - as well as the way these functionalities are perceived by the individual users.
We also have to explore the subjective preferences for specific media: e. g. the psychological need for "nearness" that underlies the preference for face-to-face meetings, or the contrary need for distance and autonomy that often explains why non-intrusive asymmetric communication channels (like Email) are preferred.
"Students also expressed differing preferences for kinds of communication based on the kinds of activity being done—they would not share bad news over IM or email; they would prefer IM or email to make plans; apologizing would be best in person; and contacting a professor is best through email. Various media thus afford the conscious delegation of interaction to different realms of experience." (Squires 2004).
We may hypothesize that such subjective factors are strongest in the initial phases of media adoption where collective normative standards and cultural patterns have not yet been established.

Social Norms:
On a second level, media usage patterns are anchored in social habits, norms and expectations. Thus, there may be expectations among interactive users that Instant messages shall take place every evening, or that a SMS is answered by another SMS, not by an Email or a call.
The more media choices are governed by such normative expectations, the less they will correlate with subjective preferences or considerations of “rational choice”. As recent studies have convincingly shown, the almost ubiquitous intensive usage of Email and mobile phones in current society is indicating the presence of strong social norms.

Cultural patterns:
On levels higher than interpersonal expectations, we find media habits anchored in collective subcultures or general macrosocietal culture.
Thus, the intensive use of mobile phones (despite rather high costs) has to be explained by the fact that they have become "fashionable" in the late 90ie, particular within teenage subcultures (Ling 2004). In addition, European teens have developed a high collective liking for Short text messages, while American youngsters prefer Email and Instant Messaging (Squires 2004).

2. Exploring the factors of individual and collective media choice

The growing diversity of alternative communication media calls for theories that can explain the use of different media on different occasions, and the mix of media used for interacting with specific individuals in the context of particular relationships and circumstances.
Clark and Brennan (1990) identify eight factors that constrain media choice**:** co-presence, visibility, audibility, co-temporality, simultaneity, sequentiality, reviewability and revisability. Seen in this perspective, physical gatherings stand out by the highest degrees of social presence with the visibility and audibility as well as with the highest level of simultaneity: so that intensive feedback is possible without any delays, costs or efforts. Computer-mediated communication (CMC), on the other hand, is particularly low in social presence (Rice and Love, 1987) and lean in media richness (Walther, 1992).

Face to face meetings

are doubtless the richest and most consequential ways of being together, maintaining immediate feedback, and experiencing the other in full spectrum of "cues given" as well as "cues given off" on a visual, acoustic and olfactorial level.
As a consequence**,** neither phone contacts nor text or email exchanges can compete with face to face meetings in generating a feeling of personal closeness (Mitrea 2006:124).

No technical communication channel matches the primary gathering in the degree in which the partners expose themselves to reciprocal perceptions and responses over which they have only very incomplete self-control and only incomplete knowledge about the full range of transmitted cues (especially on the nonverbal level of gestures and personal appearance).

In comparison, all technical media allow a communication where participants have better control over and knowledge of the emitted and transmitted information: e.g. because communication is restricted to intentional speech or writing, without being "tainted" by paralinguistic modalities or "spontaneous" mimic expressions.
FtF is especially crucial for communicating bad news: because they are more likely than good news to provoke intensive emotional feedback and extensive further deliberations (e. g. for discussing how a problem shall be solved). By contrast, good news can more easily be transmitted by any technical channels (Mitrea 2006: 108).

It has been remarked that males particularly rely on face to face gatherings because they make more use of nonverbal levels of communication Mitrea 2006):
"It is interesting to note, in this context, that the men in our groups found the lack of body-language signals in telephone communication a bigger problem than the women. Both sexes commented on this problem, and both tended to use 'emoticons'(symbols representing emotions - such as smiles, sad faces - normally expressed in body language) in text messages, but the men seemed to find talking to 'a disembodied voice' more of a handicap. It may be that men are not only less verbally skilled than women, as noted earlier, but also less 'vocally' skilled - less adept at conveying mood and emotion through variations in tone, pitch and volume." (Fox 2004).

Fixed Phones

As Noble has remarked long before many years before of mobile communication,
"It seems the telephone is a basic tool of the sociable person in terms that it provides accessibility and assists in the planning and organisation of social life." (Noble 1987:40).

Due to the richness of vocal cues as well as to the immediacy of feedback, phone calls provide more social presence and connectedness than all the text based modes of technically mediated communication (Squires 2004). Therefore, it is rated higher for functions of socializing than Email or other Internet-mediated channels (Dimmick 2000)

Audio calls provide a maximum of "connectedness", followed by IM and SM, while Email ranks lowest (Rettie 2003).
"The perceived connectedness of a medium appeared to be a function of media richness, social presence, interactivity, duration, and information processing mode. Media richness affects the quantity and quality of cues, e.g. voice tone; social presence creates awareness of the other party in the connection. Interactivity creates the experience of connection through two-way communication, and is facilitated by synchronicity and near-synchronicity." (Rettie 2003).

Audio calls of all sorts are more private and exclusive because in contrast to all textual media (IM, SMS and Email), their content cannot be forwarded to other receivers.
"A female focus-group participant wondered aloud about whether a new man in her life 'really liked' her, as she complained that 'he always texts me, but practically never phones'. (Fox 2004).

In comparison to the mobile, the fixed phone is much more used for lengthy talks driven by an intrinsic motivation to socialize and to experience personal nearness. (Mitrea 2006: 107).
In this respect, it is a rather close substitute for face to face meetings for two different reasons: because landline talks have become rather cheap or even free, and because calls tend to take place in quite private hours where the participants are disposed for longer conversations: in contrast to mobile calls which often intrude into busy situations.

This closeness is empirically demonstrated by the finding that the fix phone is much preferred when bad news has to be transmitted: because there is enough opportunity for elaborate "consolations" and for discussing how to cope with the consequences (Mitrea 2006: 108).
Thus, the fixed phone is heavily used for nonritualized personal conversations: e. g. for talking about personal problems and experiences and for disclosing subjective feelings and thoughts (Mitrea 2006: 108).
Th*"Landline telephones allowed us to communicate, but it was not the sort of frequent, easy, spontaneous, casual communication that would have characterised the small communities for which we are adapted by evolution, and in which most of us lived in pre-industrial times. Communication by landline telephone involved a certain amount of deliberate effort and planning: we could only talk at specific times and places. Gossip on work phones was frowned upon and often forbidden. We had to wait to get home, hope the other person was at home, overcome tiredness and make a conscious effort to call, often in the presence of noisy children or demanding partners. There was no telephonic equivalent of the regular brief and breezy encounters in a village or small community, where frequent passing exchanges - such as: 'Hello, nice day isn't it?', 'Yes, lovely - oh, how's your Mum?', 'Much better, thanks', 'Oh good - see you later then' - ensured that everyone felt connected to their social and support network." (Fox 2004)*

While Email and SMS messages can be sent and received at any hour and cell phone calls when partners are at any place or on the move, landline phone calls are only viable when the receiver is at home. Thus, their usage is restricted by the mere fact that most people are at home only during specific times: so that phone activity tends to concentrate on early evenings or weekend days (Lacohee/Anderson 2001: 12).Additional restrictions result from the fact that calls are experienced as "intrusive" whenever receivers are absorbed by concentrated activities or when they prefer to rest and sleep - so that they may not even be answered (Lacohee/Anderson 2001: 14).

In the case of adolescents and later teens,, such times are particularly restricted because they live a mobile lifestyle and need considerable time to commute between workplace, school and home.
In addition, they may discouraged to use the fixed phone because it is owned and controlled by the parents with whom most of them still live: so that they have to find a "right moment" for calling, and instead of the addressee, they may well meet an unwelcome "gate keeper" at the other end of the line.

On the other hand, this condition may have the effect that most landline calls are made by narrow friends - because more distant acquaintances don't know the life rhythm of the receiver - so that they may avoid calls because they don't know whether the receiver is at home (Lacohee/Anderson 2001: 13).

Empirical research on phone usage patterns has mainly focused on gender-related differences. In their extensive study, Lacohee and Anderson found that both men and women reported having some of their longest calls with people they saw rarely, but women were more likely than men to also have long chats over the telephone with people they saw regularly, even on a daily basis. Both men and women were also found to make more frequent short calls to those people they saw on regularly, especially for fixing arrangements (Lacohee/Anderson 2001). Local friends or relatives are phoned more frequently than friends or relatives living far away (Lacohee/Anderson 2001).
On the other hand, there was a clear disparity between men and women's view of what the telephone should be used for. Men claimed that it is primarily a tool for checking and making arrangements while women reported that it is vital to the maintenance of their social relations. (Lacohee/Anderson 2001).
"Twenty-four (89%) men said that they made calls with one specific purpose in mind and would close the call once this was completed. These men also claimed to know what they were going to talk about before making a call whereas eighteen (86%) women reported making calls with no specific purpose in mind other than 'chatting'." (Lacohee/Anderson 2001:9).
More females than males also reported a "proactive" (instead of "reactive") behavioural style, and they were more likely than males to have intensive phone contacts with family members and relatives (Lacohee/Anderson 2001).

This corresponds to Di Leonardos observation reports that "the work of kinship" is carried out to a disproportional degree by women (Di Leonardo 1987), as well as to Sawhney's and Gomez' ethnographic finding that wives usually act as real "information hubs" by maintaining two-way relationships to all other family members: (Sawhney / Gomez 2000).

Mobile phones

In contrast to the Internet that has produced a still remarkable "digital divide, the cell phone is a more egalitarian technology adopted also by the lower strata.
In fact , some studies have even found that the most active "pioneers" stem from lower educational levels.
"Analysis across education categories has emphasized that lower educated users were indeed drivers of wireless technology usage. They tended to send SMS more often than the older ones and to use applications, which require detailed technology knowledge and experience (ring tones, calendar, calculator, clock, etc.), more frequently. Interestingly, they seemed to access more often the function giving access to the last calls, either taken or lost, a fact that confirmed their extended network of social connections and their need to manage this complexity." (Mitrea 2006)
It was found that heavy usage of mobile phones correlates inversely with the level of education (Mitrea 2006: 86). However, the lower the level of education, the shorter the length of conversation (Mitrea 2006: 105).

Due to their rather high time-related costs , mobile talks tend to be restricted to short exchanges which don't require intensive feed and comprehensive explanation. At least in this respect, there is almost no overlap with face to face meetings which are heavily used for telling long stories and engaging in complex, open ended discussion (Mitrea 2006: 104).

Such short exchanges encompass

1) instrumental communications with the purpose to transmit useful information or to fix the time and place of meetings
2) expressive socio-emotional communications that are highly ritualized : e. g. greetings, congratulations and jokes (Mitrea 2006: 104).

On the one hand mobile audio calls are highly instrumental for initiating, coordinating and realizing face to face meetings. For instance, individuals can fix meeting dates and places when on the move, and they can rearrange times and places in reaction to unforseen short-term changes. (Larsen/Urry/Axhausen 2005).
Thus mobile phones help to realize many meetings under adverse circumstances of a highly mobile, complex and unpredictable life. *(Mitrea 2006: 103).*

On the other hand, mobiles are heavily used just “to keep in touch”: to strengthen existing social bonds by small intermediary contacts with which partners signal mutually that the relationship is still “alive and well”.
As an "antidote to alienation" (Fox 2004): the cell phone compensates for the fragmentation of social life caused by frequent geographic mobility:
Thus, Fox found that the main advantage of the mobile was the 'Martini benefit' - the ability to gossip anytime, anyplace, anywhere *"Mobiles allow you to keep up with the small details of what's going on in people's lives, and that's what makes you feel close to them. It allows you to maintain that relationship or friendship."* (Fox 2004).

The same study also showed that there were some significant sex differences in 'gossip partners', with men being more likely than women to talk with work colleagues and women more likely than men to gossip mainly with family members (Fox 2004)

While the scale of gossip seems to be similar for both genders, females have been found more likely to gossip with other female friends, while men are most likely to gossip with other females, not with their same-gendered colleagues. (Potts 2004; Fox 2004)
We may hypothesize that mobile communication (in its instrumental as well as expressive functions) has a heightened salience function in the case of apprentices who oscillate between home, school and the business where they are working.

Short text messages (SMS)

Similar to mobile audio calls, SMS are highly complementary to face-to-face meetings because they are much used to manage relationships, initiate invitations and fix the time and place of gatherings (Döring 2002). Usually, such coordinations and adjustments take place among individuals who know each other well (Potts 2004).
In addition, SMS are also symbiotic with audio calls (by fixed or mobile phone).
Particularly for females,
,”….mobile gossip is enhanced by the use of the text message as a 'trailer', alerting friends to the fact that one is in possession of an interesting item of gossip, but saving the details for a phone call or meeting. The 'trailer-text' practice seems to be mainly used by females. (Fox 2004)

Because they are so non-intrusive, SMS extend the sphere of interpersonal communication to new highly informal contacts that would not take place by audio calls: e. g. by sending out

a "goodnight kiss" just for expressing social nearness, not for expecting any reciprocating action. (Grinter and Eldridge 2001).
"*Texting is particularly important in maintaining contact with a wide social network - allows us to maintain social bonds even when we do not have the time, energy, inclination or budget for calls or visits. Texting re-creates the brief, frequent, spontaneous 'connections' with members of our social network that characterised the small communities of pre-industrial times." (Kate Fox 2004).*

Given their low costs, SMS are useful for very basic and very spontaneous communicative exchanges as they had earlier only occurred "free of cost" as a concomitant of face-to-face meetings.
"Almost all of our focus-group participants said that they found text messages an ideal way to keep in touch with friends and family when they did not have the time, energy, inclination or budget for a 'proper' phone conversation or visit." (Fox 2004).

As they are quite cheap, they are much used by younger teens who have to keep their phone bills low, especially by incumbents of lower social classes (Fox 2004).

And as they can be manufactured, sent and retrieved quite discretely, they are much used during school or at work places where no audio calls can be sent out or answered. Because they usually cannot be read by any bystanders, SMS offer much more privacy than audio calls which can drop into completely unpredictable environments where unwelcome third parties may be present (Ling/Yttri 1999; Geser 2003;).
Some research suggests that the use of text messaging may be perceived as a form of socially acceptable gift (Taylor & Harper, 2003). This corroborates the hypothesis that text messaging is generally utilized to strengthen pre-existing relationships by just providing a new channel for its continuous confirmative expression (Bryant/Sanders-Jackson/Smallwood 2006).

In comparison to Email, they lend itself better to ongoing communication because senders can be certain that they are received and answered rather soon (usually within an hour) They are "semi-synchronous": occupying and intermediate position between IM and Email.
In addition, they are more private because they can less easily sent to masses of recipients.
Finally, SMS are less formal and more private then email messages (Clarke and Strong 2000) , because they have to be so short that a "restricted code" (full of particularistic abbreviations) is used: a language often not understood outside a particular relationship or subcultural group (Geser 2003). But given their shortness, SMS texts tend to become reduced to ritualized formula, so that they generate even less feelings of personal closeness: even less than Email messages (Mitrea 2006).
This characteristic makes them highly functional for people to shy to engage in intimate relations or too unwilling to engage in any kind of lengthy and intensive conversation:
"Although our national survey showed that women use texting more than men, this last comment also reflects a tendency among some male participants in our focus groups to use texting as a way of avoiding talking - particularly where they feel too shy or awkward, or in some cases too lazy, to have a conversation. One participant, for example, always sends text messages to his mother, as he knows that phoning her would tie him into a long conversation. Before mobiles, he simply avoided calling her at all. (The notion of needing to have "enough information for a conversation" also seemed to be peculiarly male: the women in our groups could conduct long conversations on the basis of very little factual information, or indeed none at all.) (Fox 2004).

Such functional characteristics have also been used to explain why teens make so heavy use of text message communication, while shifting to audio calls when they reach about the age of twenty. .(Ling 2001: 10).
This change can be explained by the assumption that SMS is more adequate for life stages characterized by high personal insecurity and highly problematic social relations: because it

helps to keep distance and to leave open a ready exit option whenever contacts are not reciprocated.
"Problems of shyness, awkwardness and difficulties with social and communication skills may also help to explain why texting has become so popular among teenagers (along with the obvious cost factor). Adolescence is a difficult time: teenagers tend to be highly self-conscious, concerned about what others think of them and anxious about their social status within their peer group. The social functions of gossip outlined above suggest that this is one of the principal ways in which such difficulties are 'negotiated' and overcome. Through gossip, young people learn the rules of their social circle: what kind of conduct is and is not acceptable, why people are liked or disliked, how to resolve conflicts and navigate status issues. Texting, because it allows that extra time to formulate one's thoughts and express them more clearly, or more diplomatically, is an invaluable tool in this process". (Fox 2004)

Email

is the most polyvalent channel of communication because it bridges the spheres of work and leisure, it is used for expressive and instrumental purposes alike, and for bilateral as well as for multilateral communication.
As an asynchronous medium with slow and unreliable feedback, it does not lend itself to intensive reciprocal. Consequently, Email ranks very low in terms of connectedness and sociability - so that individuals who want to experience social belongingness usually prefer SMS or the phone. Thus, research indicates that the impact of Internet communication on individual well-being is low or inexistent (Baym et. al. 2004), and Schiano et al. (2002) found that teenagers mainly use email for non-personal communication.
Therefore, frequent email exchange does not seem to contribute much to the closeness and intimacy of a relationship (Cummings et. al. 2002), and it cannot compete with the phone as a medium for sharing good or bad news (Randall 2002).
However, some authors claim that Email is a very potent means to maintain interpersonal relationships, because it can be used for expressive signals and small talk as well as for goal-directed communication (Dimmick /Stafford 1999). It seems to be most adequate for highly complex and "individualized" relationships where partners need time to absorb what the senders have written and to think about their answers.

At least in this respect, Email seems to be a near substitute to longer talks over the landline phone. In fact, a study of 309 personal Email users in Ohio found that nearly half say they make fewer long-distance telephone calls since they've gone online. But the results also showed e-mail and telephone conversations each met different needs for users. Respondents said the telephone was superior to e-mail for expressing emotions and affection, giving advice and providing companionship. On the other hand, Email was rated better for overcoming schedule and time conflicts when trying to reach friends and family, and for communicating with people in different time zones. "People liked the fact that you can leave an e-mail anytime, and no one has to respond immediately. People can communicate on their own schedules, which makes it much easier to keep in contact," Dimmick said (DImmick /Kline / Stafford 2000).

Astonishingly however, Email resembles cell phone calls in the sense that most messages are local and are *"concerned with local arrangements, sustaining contact with familiar faces and arranging and rescheduling face-to-face meetings" (Larsen / Urry / Axhausen 2005:16).*

3. Research Questions and Research Design

In the following, we want to explore the interdependencies of different communication channels within informal interpersonal relationships among older teens.
Do *substitutive* relationships prevail: so that an intensive use of phone calls makes it less necessary to send emails and SMS or to arrange meetings? This would certainly be the case if a constant volume of information has to be transmitted: as it is the case in highly specific (e. g. bureaucratic procedures or commercial) transactions.
Or are the different channels *complementary*, so that their usage rates are positively correlated and they all contribute to make relationships closer? Such conditions would hold in highly dynamic interpersonal relations where face-to-face interactions engender new disclosures or common projects that make subsequent phone or mail contacts necessary, or where calls and SMS are used as tools for meeting arrangement.
How do such interchannel relationships differ according to the gender of interacting partners, and how do they change between initial and more advanced staged of interpersonal acquaintance?

The empirical results reported below are based on a survey carried through in September and December 2003 at several vocational schools in Zurich (Switzerland) comprising young apprentices (mostly between 17-21 years old) in the field of construction, office administration as well as fashion and design. Based on the teacher's permission, the standardized questionnaire was applied during classes, so that a very high return rate (of more than 95%) could be achieved. On the average, it took students a mean of 30 minutes of class time to complete the questionnaire. As an incentive to answer the questions thoroughly, students who took part in the survey could choose to have their names drawn for a prize.

The pervasiveness of the new technology is dramatically demonstrated by that fact that out of 1415 respondents, not less than 1356 (=95.8) percent were currently in possession of a personal mobile phone, and among the 59 non-owners, 28 had the habit of borrowing sometimes a set from a sibling or friend.

Among the owners, a rather equilibrated distribution according to gender and age was achieved (Table 1).

Table 1: Frequency distribution of respondents: according to gender and age

Gender:	**Current age (2003)**					***Total***
	-17	**18**	**19**	**20**	**21+**	
female	103	185	152	55	56	*551*
male	165	216	209	109	106	*805*
Total	*268*	*401*	*361*	*164*	*162*	*1356*

The highly multicultural demographic structure of Switzerland today was mirrored in the fact that more than 30% of all respondents (421) were originating from a foreign country.

In the questionnaire, informants had to provide more detailed information about the three persons with which they had the most intensive contacts by mobile phone. Apart from their gender and kind of relationship (kinship, friend, partner), they had to indicate the total frequencies of mutual communicative exchanges: mobile calls, mobile text messages (SMS), fixed phone calls, email messages and physical meetings. In addition, it was asked how "close" they subjectively felt to these partners, and how long the relationship was already in existence.

Who is preferably included into this innermost communicative circle? Table 2 shows that there are two significant divergences between the two genders:

1) Males give more weight to "colleagues" (of the same as well of the opposite sex), while women are more inclined to include their partners (boy-friends) and relatives.
2) Women are more disposed to have frequent contacts with relatives of the same sex (e. g. mother or sisters), while males divide their attention equally between both sexes.

This accord well with the assumption that young females tend to maintain closer relationships to family members, and that mothers are more likely than fathers to have intensive communication with their (female and male) kids.

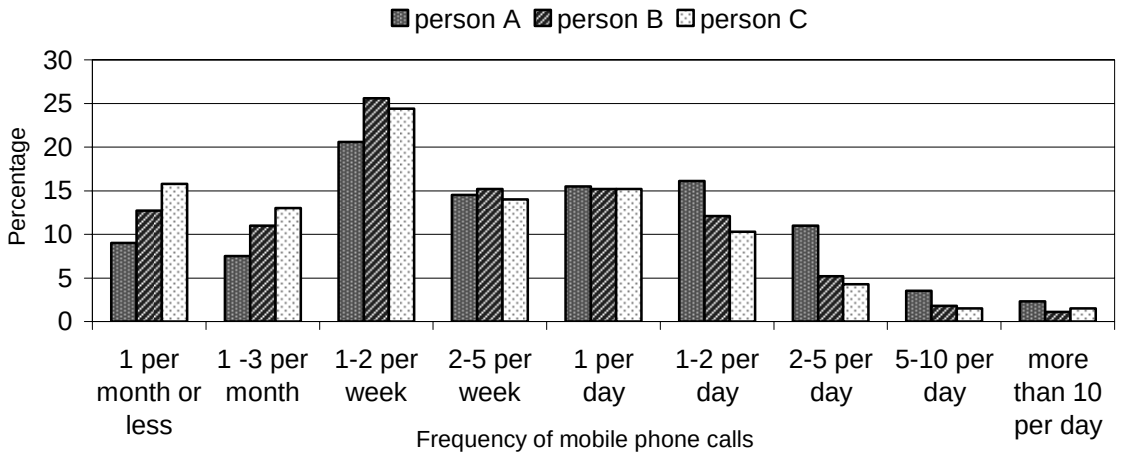
Table 2: Frequency distribution of the three persons most frequently contacted by cell phone calls and SMS: according to gender and type of social relationship (percentage values and total frequencies)

Gender of the contacted person:	Females			Males		
	Relationship to the contacted person			Relationship to the contacted person		
	partner	colleague	relative	partner	colleague	relative
female	2.8 *(45)*	40.2 *(654)*	11.2 *(183)*	13.1 *(309)*	30.4 *(717)*	5.6 *(127)*
male	17.6 *(287)*	24.4 *(397)*	3.8 *(62)*	0.6 *(16)*	44.3 *(1044)*	6.0 *(142)*
total	100% (1628)			100% (2355)		

4. Total amount of communicative relations

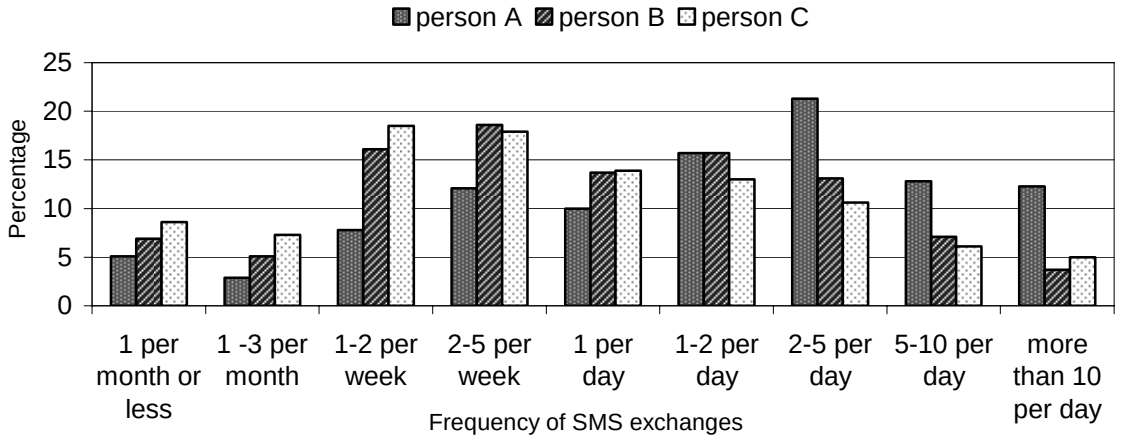
Looking at the total frequency of cell phone contacts (initiated by either side), it is evident that it spreads over an astonishingly broad range. Even with the most contacted person A, only about half of all informants exchange at least one call per day, while most of the others have only 1-2 contacts per week - the same intensity as maintained with B and C (Figure 1). High economic costs may explain why only very small minorities maintain extremely intensive communications (with 5 or more audio calls each single day).

Figure 1: Total amount of mobile phone calls exchanged with the three most contacted partners: frequency distribution (percentages).



SMS traffic is different insofar as it somewhat more focused on one person (A) with whom at least two messages are daily exchanged in about 50% (and even five or more in 25%) of all cases (Figure 2).

Figure 2: Total amount of SMS exchanged with the three most contacted partners: frequency distribution (percentages).



Figures 3 and 4 show the average frequencies of communicative exchanges female and male respondents realize on all channels with their three partners.

Figure 3: Frequency of yearly communicative contacts through different media with the three most contacted persons (female respondents)

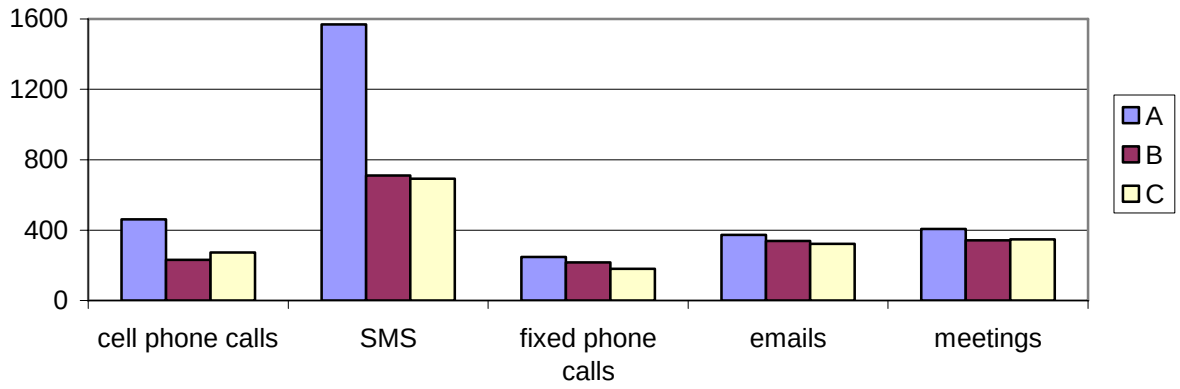
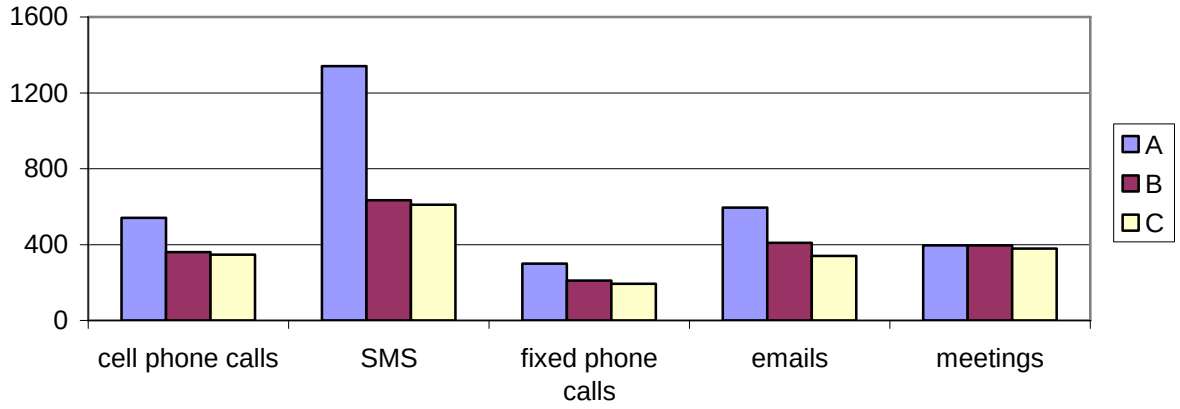


Figure 4: Frequency of yearly communicative contacts through different media with the three most contacted persons (male respondents)



From these graphics, at least the following five conclusions can be drawn:

1) SMS is the most frequently used channels. In all cases, it absorbs about 30-40% of all occurring communications.
2) On the average, all three partners are contacted with high frequency on all available channels. This indicates that cell phone calls are embedded in a wider range of constantly ongoing complementary communications which include also Email and physical meetings almost on a day per day basis, as well as fixed phone calls about 2-3 times a week.
3) Males show consistently higher rates than females, except in contacts by SMS, where women (especially of lower age groups) win out.
4) Both genders tend to focus SMS particularly on a single person (A), why all other communications are far more equilibrated among all three.
5) Apart from being most frequently contacted by the mobile phone, person A also receives (or sends) more Emails and SMS than person B and C, and at least females tend to see him (or her) most frequently face-to-face. These results are a strong indicator that at least within this core communication network, complementary instead of substitutive relationships tend to prevail among both genders.

5. Relationships between the Five Channels: Intercorrelations and Factor Structures

As suggested by Figure 3 and 4, the intercorrelations between the absolute contact frequencies are predominantly positive or near zero, while negative relationships are conspicuously lacking (Table 3).

Table 3: Intercorrelations between the frequencies of different modes of communication with the three most contacted partners (absolute number of contacts) (above the diagonal: females:; below the diagonal: males)

(First line: Person A; second line: Person B; third line: person C)

	Meetings	**Fixed phone**	**Mobile**	**SMS**	**Email**
Meetings	--	.25** .29** .37**	.21** .28** .29**	.08 .04 .08	.06 .05 .04
Fixed phone	.39** .26** .30**	--	**.56**** **.47**** **.55****	.29** .27** .30**	.08 .01 .08
Mobile	.43** .30** .32**	**.58**** **.59**** **.66****	--	.29** .47** .44**	.13** .08 .19**
SMS	.21** .12** .15**	.44** .40** .53**	.55** .61** .68**	--	.20** .09* .18**
Email	.13* .09* .11**	.15** .09* .18**	.29** .23** .14**	.19** .19** .26**	--

** p < .05; ** p < .01*

Both genders converge in maintaining particularly high covariations between fixed phone and mobile phone calls. This indicates a highly complementary functionality between these two basically similar oral channels, e. g. in the sense that many talks initiated during the day by mobile are continued in the evening by lengthier landline conversations. Mobile audio calls as well as text messages are well in the center of communication structure, because they correlate significantly with meeting frequency as well as fixed phone contacts and Email exchanges. However, these interrelationships are generally stronger for males than for females. In particular, males are more disposed than females to use SMS and audio calls (mobile and landline) in a rather parallel fashion.

Email, on the other hand, appears as the most isolated of all channels, particularly for females where online exchanges are not at all associated with phone contacts and physical meetings.

The Varimax-rotated factorial structures presented in Table 4 are apt to summarize and accentuate these gender-related differences.

First of all, it is evident that the communicative behaviour of males is governed more by two dominating factors (absorbing together more than 52% of the whole variance), while the behaviour of females is less structured (as the two min factors extracted explain only 39%).

Secondly, a comparison of the first factors reveals that in the case of females, the two mobile channels (audio and SMS) constitute a communicative dimension completely dissociated

from all others, while males combine mobile communication tightly with the usage of fixed phones.
Third, it is evident that in the case of females, much communicative behaviour is patterned by partners rather than media, while males show a media-typed pattern throughout. In other words: males can more easily be characterized by their degree of 2meeting orientation" or "Email-orientation", (because they tend to be high or low on these channels vis-à-vis all three partners), while females can be better described by their A- or B-C-orientation: because they tend to use all channels intensively when such relationships are intimate and infrequently when they are not.

Table 4: The factorial structure of the five communicative exchanges with the three most contacted partners (absolute number of contacts): according to gender

1. Eigenvalues and explained variance of the factors

	Males			Females			
	I	**II**	**III**	**I**	**II**	**III**	**IV**
Eigenvalue	5.718	2.151	1.357	4.259	1.579	1.449	1.172
% of Variance	38.12	14.34	9.05	28.39	10.53	9.66	7.82

2. Factor Score Matrix (Orthogonal Varimax Rotation)

	Males			Females			
	I	**II**	**III**	**I**	**II**	**III**	**IV**
A meetings	.27	.12	**.65**	-.14	.305	**.577**	-.09
B meetings	.07	.05	**.80**	-.09	**.598**	.159	.150
C meetings	.11	.05	**.62**	.02	**.622**	.068	.09
A fixed phone	**.70**	.05	.34	.33	.385	**.549**	-.13
B fixed phone	**.65**	-.06	.29	.29	**.656**	.105	-.13
C fixed phone	**.77**	-.04	.29	.32	**.695**	.006	-.03
A mobile	**.72**	.21	.28	**.48**	.23	**.55**	.03
B mobile	**.78**	.13	.27	**.60**	**.43**	.19	-.01
C mobile	**.77**	.03	.15	**.63**	**.48**	-.04	.05
A SMS	**.62**	.15	.00	**.62**	-.09	**.35**	.08
B SMS	**.72**	.14	-.04	**.79**	.04	.05	.08
C SMS	**.76**	.18	-.07	**.80**	.11	-.15	.06
A Email	.09	**.83**	.13	.02	-.19	**.57**	.38
B Email	.11	**.91**	.05	-.00	.01	.17	**.80**
C Email	.15	**.88**	.06	.17	.15	-.16	**.76**

While these results refute the substitutability assumption rather strongly, they corroborate the hypothesis of complementarity only in a weak sense, because the positive intercorrelations could well be caused by different overall levels of "communicability" among our informants. In order to eliminate this personal factor, we take the total number of contacts (to person A, B, or C) as 100 percent and ask how the percentage shares of the different communication channels are interrelated.
As it has to be expected for logical reasons, negative correlations prevail in the matrix because all five shares always add up to 100%). The more astonishing it is to find that signifi-

cant positive relationships between mobile and fixed phone usage remain even under these harsher test conditions (Table 5). Thus, it seems that males and females converge in using landline and mobile audio calls in a highly parallel manner. In a weaker way, face-to-face-meetings seem also to belong to this core cluster because very low or zero correlations prevail here, not the expected negative coefficients. On the other hand, meetings and SMS are most likely to be near substitutes because negative intercorrelations are consistently very high.

Table 5: Intercorrelations between the percentage shares of different contact channels (related to the total communication volume with the respective person) (above the diagonal: females:; below the diagonal: males)

(First line: Person A; second line: Person B; third line: person C)

	Meetings	**Fixed phone**	**Mobile**	**SMS**	**Email**
Meetings	--	-.01 -.12** -.06	+.05 -.08 -.11*	-.55** -.53** -.58**	-.20** -.25** -.24**
Fixed phone	+.04 -.05 -.06	--	**+.15**** **+.13**** **+.11***	-.43** -.33** -.35**	-.21** -.22** -.21**
Mobile	+.03 -.12** -.13**	**+.10**** **+.09*** **+.08***	--	-.46** -.26** -.28**	-.24** -.25** -.24**
SMS	-.54** -.49** -.52**	-.40** -.35** -.31**	-.41** -.28** -.33**	--	-.30** -.34*** -.30**
Email	-.26** -.34** -.34**	-.20** -.25** -.25**	-.22** -.27** -.24**	-.34** -.26** -.23**	--

** p < .05; ** p < .01*

Factor analysis reveals that in the case of both genders, shares of fixed phone, mobile and Email usage are three highly independent dimensions of communication, while meetings and SMS appear (conforming to our expectations) as polar opposites, but rather unrelated to everything else (Table 6)..

Table 6: The factorial structure of the percentage shares of different contact channels (related to the total communication volume with the respective person): according to gender

1. Eigenvalues and explained variance of the factors

	Males					Females				
	I	**II**			**III**	**I**	**II**	**III**		**iV**
Eigenvalue	3.459	2.732	1.912	1.828	1.199	3.360	2.186	1.663	1.664	1.154
% of Variance	23.06	18.21	12.74	12.18	8.00	23.39	14.57	11.06	10.96	7.70

2. Factor Score Matrix (Orthogonal Varimax Rotation)

	Males					Females				
	I	**II**	**III**	**IV**	**V**	**I**	**II**	**III**	**IV**	**IV**
A meetings	-.18	-.01	-.01	**.84**	.01	.14	-.18	**.75**	-.06	.10
B meetings	-.24	-.11	-.04	**.64**	.43	-.18	-.19	**.73**	-.04	.25
C meetings	-.24	-.09	-.12	.13	**.86**	-.08	-.13	.27	-.08	**.80**
A fixed phone	-.08	.07	**.76**	.19	-.05	.01	-.04	.22	**.75**	-.13
B fixed phone	-.11	.02	**.85**	.03	-.01	.10	-.08	-.00	**.78**	.02
C fixed phone	-.11	-.01	**.82**	-.08	.13	.00	.16	-.12	**.74**	.25
A mobile	-.09	**.81**	-.01	.14	.00	**.71**	.00	.20	.06	-.06
B mobile	-.15	**.83**	.03	-.01	.02	**.81**	..17	.07	.02	.03
C mobile	-.06	**.82**	.05	-.01	.05	**.78**	-.11	-.10	.02	.13
A SMS	*-.39*	*-.36*	*-.26*	**-.72**	-.02	*-.42*	*-.32*	***-.66***	***-.33***	.03
B SMS	*-.38*	*-.27*	*-.33*	**-.47**	-.39	*-.24*	*-.32*	***-.58***	***-.34***	-.30
C SMS	*-.33*	*-.28*	*-.25*	-.06	***-.77***	*-.24*	*-.28*	-.13	***-.24***	**-.83**
A Email	**.84**	-.09	-.10	-.03	.05	-.09	**.72**	-.06	-.04	-.01
B Email	**.87**	-.13	-.14	-.11	.01	-.07	**.76**	-.05	-.08	.12
C Email	**.81**	-.14	-.12	-.00	-.13	-.10	**.75**	-.01	-.010	-.05

6. On the Relationship between Mobile Calls and Fixed Phone Calls

All our findings refute the common sense assumption that the mobile leads to a demise of the traditional landline phone. To the contrary, it can be shown that the usage intensity of these two channels covary positively, even when percentages values instead of absolute frequencies are considered (Table 3 /Table 5). More detailed analyses demonstrate that the strength of this covariance depends on the gender composition of the interactive partners. It is highest when communication takes place between male and female, and it is weakest in contacts among males (Table 7). Only in heterosexual pairs, the relationship remains significantly positive when percentage shares (instead of absolute frequencies) are correlated.

Table 7: Correlations between the frequency of fixed phone calls and cell phone calls: according to the gender of interacting partners: bivariate correlations and partial correlations (with index of total communication controlled)

	A			B			C		
	male / female	**male / male**	**female /female**	**male / female**	**male / male**	**female /female**	**male / female**	**male / male**	**female /female**
Absolute frequencies	+.61**	+.44**	+.60**	+.66**	+.54**	+.48**	+.58**	+.44**	+.48**
Percentage share[1)]	+.15**	-.03	+.02	+.18**	+.00	+.13*	+.17*	-.02	+.06
(N =)	*(489)*	*(294)*	*(215)*	*(308)*	*(439)*	*(303)*	*(325)*	*(415)*	*(291)*

** p < .05 ** p < .01*

[1)] *Percentage of the sum total of yearly meetings, fixed phone calls, cell phone calls, SMS and Emails with the respective person.*

7. Relationships between Physical Meetings and Technically Mediated Communications

As reported in Table 3, the usage of all technical channels is relatively weakly related to the frequency of face-to-face encounters, especially in the case of females. Nevertheless, the mix of media is rather different for partners rarely seen and for individuals met once or even several times a day (like family members or close colleagues in school or at work). When meetings are rare, a very large percentage of all communications take place as Short Text Messages, while all other channels lag drastically behind (Figure 5a to 5c). The only exception is person C where Email is used with similar intensity (Figure 5c). In the case of all three partners, Email contacts gain considerable weight when meeting frequencies are intermediate (up to about two times weekly), while they are surpassed by oral mobile calls whenever the partner is physically met on a daily basis.
The complementarity assumption is corroborated especially for the two oral channels where usage raises consistently with increasing encounters. Some substitutive effects seem to be working in text communication with person A. Here, we see that SMS is heavily used with absent partners met only a few times every year, and that less Email messages are exchanged with daily partners than with persons encountered only several times per month (Figure 5a).

Figure 5a: Frequencies of phone and email communications: according to the frequency of physical meetings (Person A)

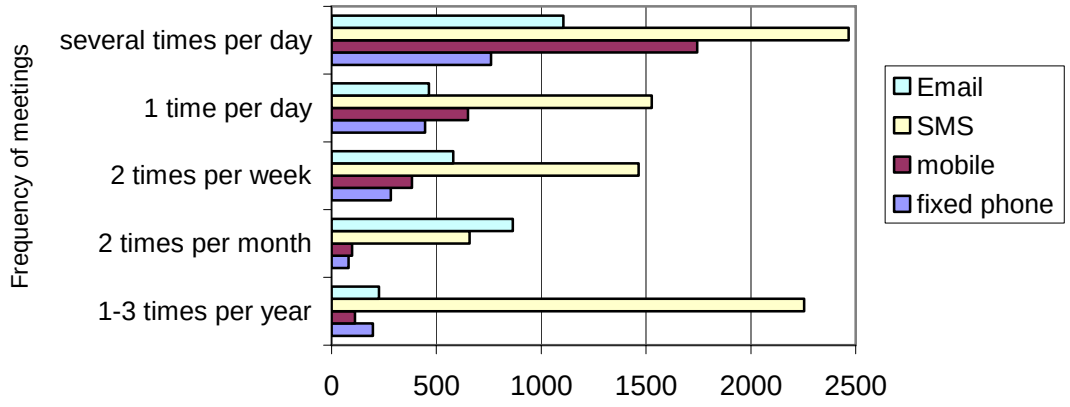


Figure 5b: Frequencies of phone and email communications: according to the frequency of physical meetings (Person B)

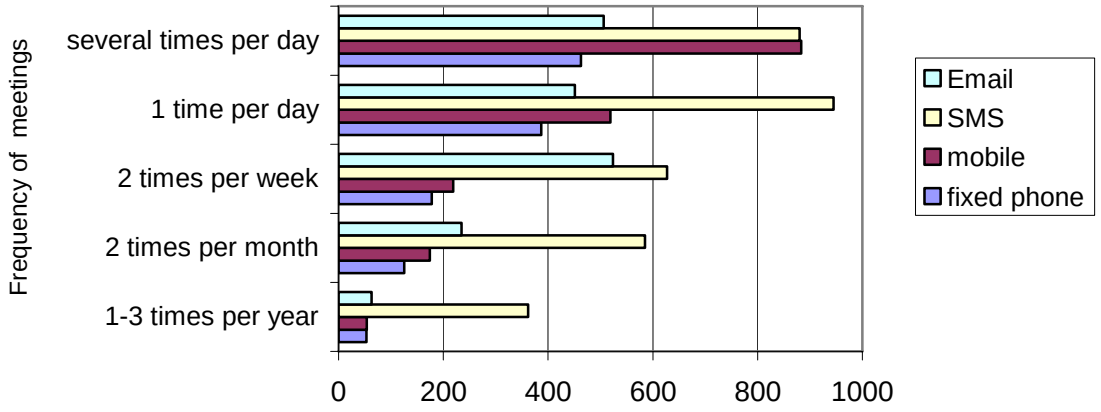
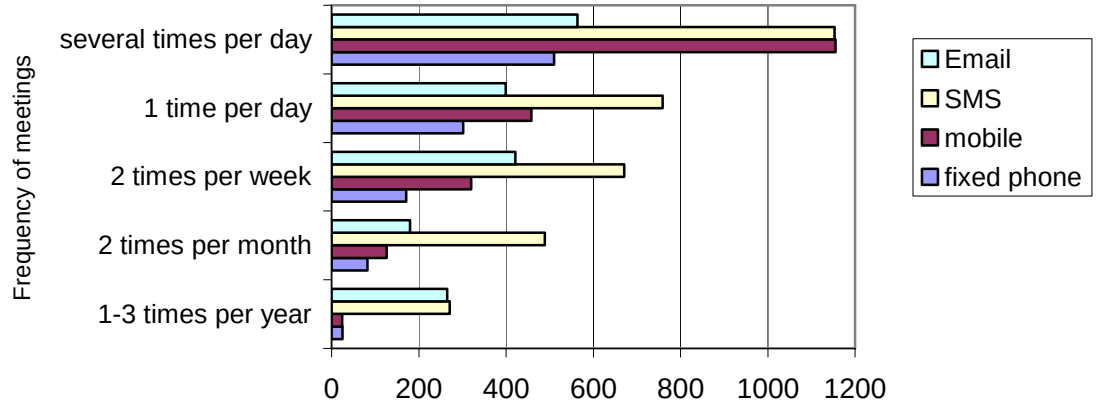


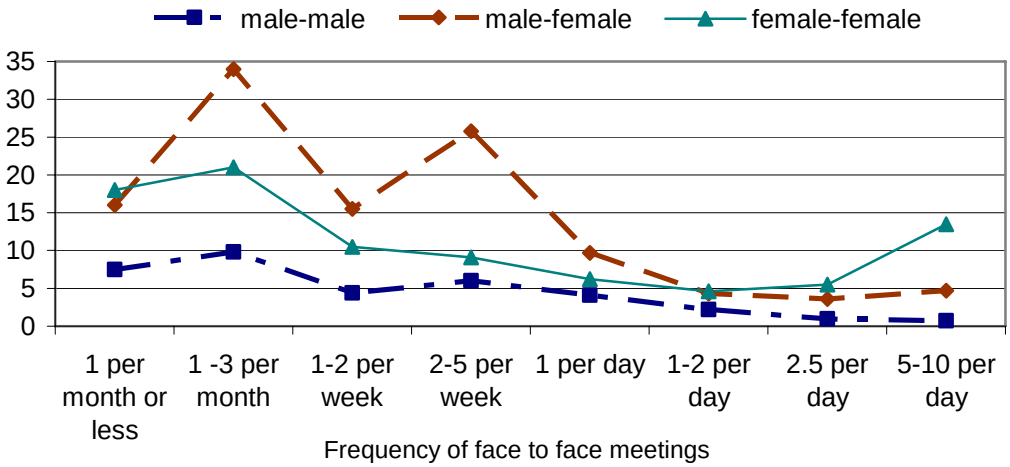
Figure 5c: Frequencies of phone and email communications: according to the frequency of physical meetings (Person C)



Overall, it seems that the two mobile channels have the most tight complementary relationship to physical meetings. As they represent the most informal communication channels available anytime and anywhere, they are evidently more disposed than Email or the fixed phone to carry on talks initiated in meetings or to arrange future encounters.

Respective statistical analyses show that meeting frequency and technically mediated communications are similarly related in both genders, with one significant exception: the relationship between mobile calls and SMS. Here, we find that when rarely meeting partners are a heterosexual pair, they exchange far more SMS than audio calls, while the two channels are far more equilibrated among two women - and even more among two males. However, there is a general tendency that communication shifts from written to oral channels when meeting frequency increases (Figure 6).

Figure 6: Quotient between the number of SMS and the number of cell phone calls: accor-ding to the frequency of physical meetings: for different gender compositions (Person A)



8. Older and more recent acquaintances

We may hypothesize that high level communication on all channels is more typical for recently formed relationships, because processes of mutual disclosure and of exploring common ideas and activities are still intensively going on. With increasing time and consolidation, we may well see a decline in mutual exchanges as well as a shift toward less informal spontaneous channels (e. g. the traditional landline phone).
The results conform only partially with these expectations. In fact, the exchange of short text messages is most intensive among newly acquainted partners and loses constantly ground in more mature relations. However, the usage of all other channels is not consistently correlated with duration. Person B receives even most oral contacts (by mobile and landline) when acquaintanceship extends over more than 10 years (= e. g. in the case of family members). Interestingly, Email exchanges are related in a curvilinear fashion: achieving their maximum in relationships that have formed 1-2 years ago. (Figure 7a to 7c).
While the fixed phone - as expected - keeps its position during time, it is also evident that the mobile phone has successfully penetrated older relationships that have existed long before cell phone sets have come into existence.

Figure 7a: Frequencies of yearly phone and email communications: according to the duration of the relationship (Person A)

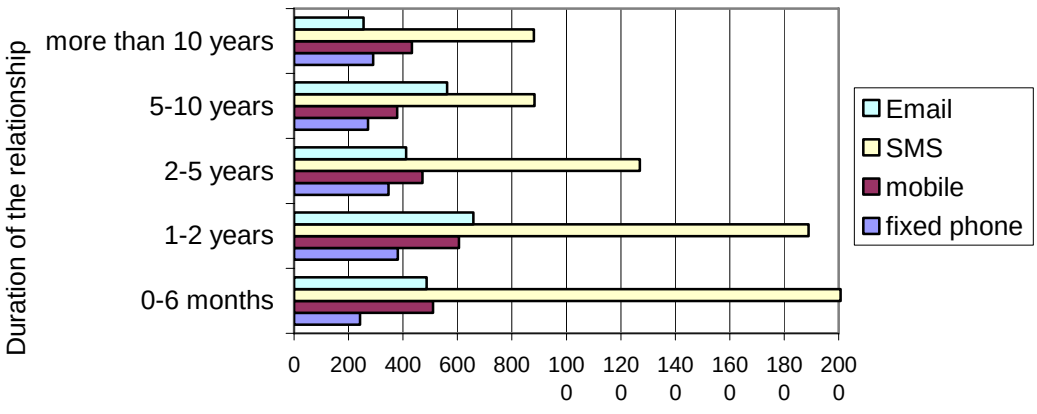


Figure 7b: Frequencies of yearly phone and email communications: according to the duration of the relationship (Person B)

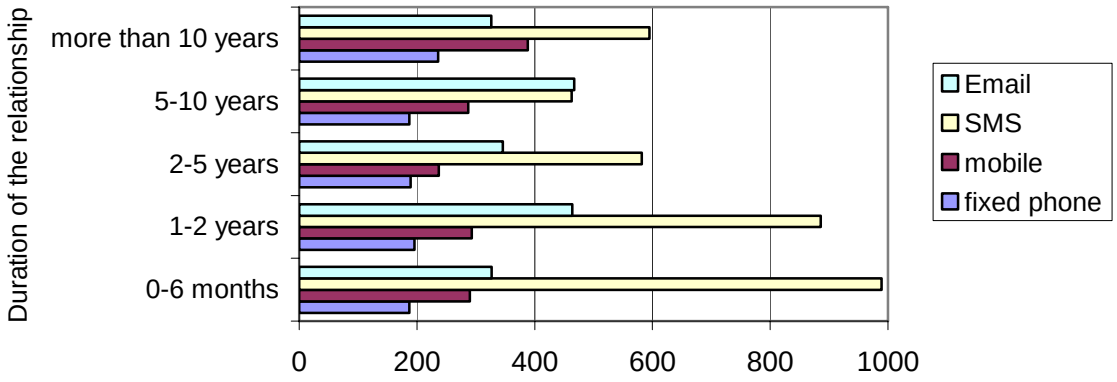
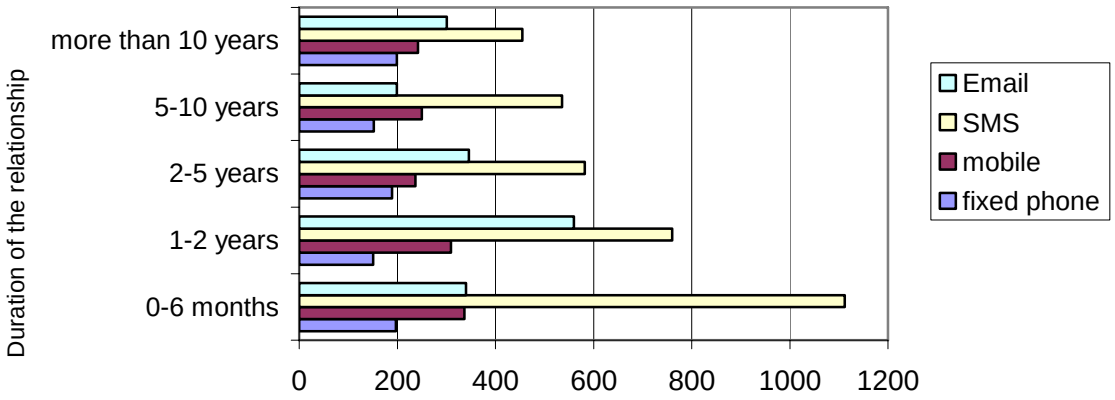
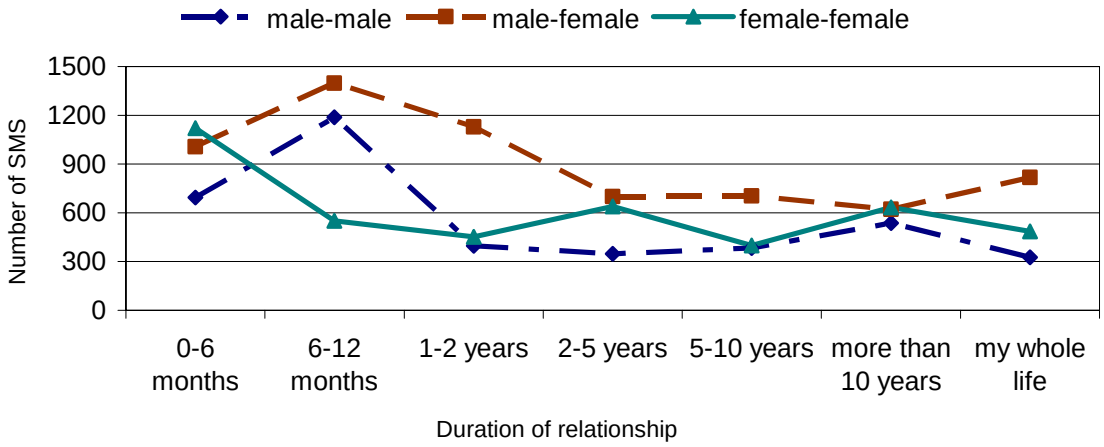


Figure 7c: Frequencies of yearly phone and email communications: according to the duration of the relationship (Person C)



The correlation between SMS use and length of relationship is heavily mediated by the gender of interacting partners. As exemplified by person B, heterosexual pairs keep much longer to a high intensity of text exchanges than same-gendered partners, especially males (Figure 8).

Figure 8: Frequency of SMS exchanges (per year) in relation to the duration of the relationship with person B : according to gender composition



Looking at the full intercorrelation matrix, it is evident that the relationships among the five channels is not affected much during time. However, more recently formed interpersonal bonds are characterized by tighter co variations between meetings on the one hand and mobile calls and Email messages on the other - while fixed phone calls and SMS remain unaffected (Table 8). This accords well with the assumption that nascent human relationships are often diffuse in the sense of stretching over several communicative levels at the same time, while older relationships may be more specialized - so that they can be more easily kept within one channel without affecting others. In other words: within given relationships. complementary relations between different channels tend to diminish rather than to increase.

Table 8: Intercorrelations between the percentage shares of different contact channels (related to the total communication volume with the respective person) (above the diagonal: duration of acquaintance 2 years or less; below the diagonal: duration of acquaintance more than 2 years).)
(First line: Person A; second line: Person B; third line: person C)

	Meetings	**Fixed phone**	**Mobile**	**SMS**	**Email**
Meetings	--	+.35** +.26** +.43**	**+.43**** **+.44**** **+.40****	+.23** +.11 +.16**	**+.18**** **+.17*** **+.24****
Fixed phone	+.32** +.27** -.06	--	+.57** +.48** +.70**	+.38** +.28** +.43**	+.18** -.04 +.14**
Mobile	**+.30**** **+.25**** **+.29****	+.58** +.55** +.56**	--	+.46** +.31** +.42**	+.36** +.08 +.14**
SMS	+.12** +.18** +.15**	+.40** +.41** +.44**	+.44** +.69** +.71**	--	+.20** +.08 +.27**
Email	**+.05** **-.10**** **+.03****	+.06 +.07** +.15**	+.07 +.22** +.18**	+.15** +.19** +.17**	--

** p < .05; ** p < .01*

9. Impacts on the closeness of relationship

While the five communication modes fulfil highly different functions because of their divergences in bandwidth, richness, interactivity, personal presence and various other attributes, many research studies have shown that they can all contribute to making interpersonal relationships closer, more intimate and emotional.
As the respondents had to characterize the relationship to partners A, B, and C on a scale of "personal closeness" ranging from 1 to 10, we can use linear multivariate regression analysis for finding out whether and to what degree the five communicative channels add to this closeness under various intervening conditions.

As seen from Table 8, closeness to all three partners is significantly determined by the frequency of face-to-face meetings as well as the number of fixed phone calls, while mobile calls, SMS and Email are not consistently related. As expected from the results in Figures 4 and 4, we find that the relationship to person A is special in being highly correlated with SMS exchanges.

Table 8: Impact of five communication modes on the "closeness" of relationship (Multivariate Regression Analysis; standardized BETA-coefficients): all respondents

Communication channel:	Person A		Person B		Person C	
	BETA	**sign.**	**BETA**	**sign.**	**BETA**	**sign.**
Face-to-face meetings	**+.06**	**.033**	**+.12**	**.000**	**+.14**	**.000**
Fixed phone calls	**+.10**	**.003**	**+.08**	**.022**	**+.08**	**.036**
Mobile phone calls	-.07	.057	-.05	.239	-.06	.128
Mobile SMS	**+.12**	**.000**	+.06	.079	+.05	.200
Email	-.02	.527	**+.06**	**.044**	-.04	144
R-Square	.031		.031		.030	
(N =)	*(1265)*		*(1252)*		*(1242)*	

In a more detailed analysis, it is found that the positive effects of fixed phone contacts emerge only when the number of yearly meetings is rather low, while they vanish completely in cases where partners meet on a day to day basis (Table 9). This result indicates strongly that fixed phone communication may be a substitute for producing (or maintaining) personal closeness under conditions where opportunities for face-to-face contacts are restricted.

Table 9: Impact of four communication modes on the "closeness" of relationship (Multivariate Regression Analysis; standardized BETA-coefficients): according to frequency of meetings

Communication channel:	Person A		Person B		Person C	
	Meetings per year		**Meetings per year**		**Meetings per year**	
	- 75	**301+**	**-75**	**301+**	**-75**	**301+**
Fixed phone calls	+.20**	+.02	+.11*	-.08	+.10*	+.01
Mobile phone calls	-.09	-.09	-.01	-.01	+.03	-.19*
Mobile SMS	+.13	-.14*	-.01	+.12	-.04	+.18*
Email	+.03	-.07	+.04	-.02	-.01	-.18*
R-Square	.048	.004	.016	.011	.013	.024
(N =)	*(416)*	*(327)*	*(428)*	*(290)*	*(599)*	*(252)*

** p < .05 ** p < .01*

10. Conclusions

Today, almost all closer interpersonal relationships have to be analyzed as hybrid multimedia processes that combine primary face-to-face gatherings with phone calls, text and image transmissions. Instant messaging or video streaming sessions and other digitalized communications. On a daily - and sometimes even an hourly - basis, we make decisions about what channels to use in which specific situation for satisfying what kind of communicative need - usually without reflecting rationally about the functions and disfunctions of the various media we have at hand.

Our common sense views are strongly determined by ideas of media substitution: who still writes mailed letters when writings can be transmitted speedier by Email or SMS? And why

invest travel time for appointments when even highly complex problems can be discussed on the phone? Such considerations are certainly adequate when the task is just to fix an agreement or to transmit a specific amount of information, as it is the case in many formalized bureaucratic or professional settings. In informal interpersonal relationships, however, such "zero-sum models" of communication are fatally flawed, because they ignore that every communication on one level can beget additional communicative needs that reinforce the use of other channels. For instance, a short SMS "I've got the job" may well give rise to lengthy evening talks on the landline phone for discussing the new life perspectives implied by this lucky event; and the mere availability of the mobile phone may motivate to arrange additional meetings that would not occur if appointments had to be made by clumsier traditional channels.

The results of our Swiss teenager study support the contention that the new digital media contribute to a self-escalating dynamics of bilateral relationships: so that ever higher communicative intensities on all available channels are achieved.

1) By identifying the three partners with the most intensive mobile contacts, it is found that these same partners are also frequently contacted by physical meetings, by email exchanges or by the conventional landline phone.
2) Looking at the intercorrelation matrix of absolute contact frequencies on all channels, we find that there are no negative coefficients as they would be expected in the case of media substitution.
3) Males seem particularly prone to use all media channels in a complementary fashion, as all intercorrelations are significantly positive and factor analysis results in a very potent primary factor. Females are more disposed to use channels independently of each other. In particular, SMS and Email contacts have no relationship to meetings, and Email exchanges no connection to contacts over the landline phone. Females are also more likely to structure their communicative behaviour according to partners; males organize it more by media channels, regardless of the partners involved.
4) Among both genders, there is a particularly strong complementarity between the fixed and the mobile phone: so that even their percentage rates (of all occurring communications) are positively related.
5) Higher frequencies of face-to-face meetings are associated with more intensive usage of all other media, particularly the mobile phone.
6) When partners meet rarely, the communicate more by written than by oral media, particularly by SMS. This tendency is most pronounced in mixed male-female pairs and weakest among males.
7) By comparing older acquaintances with more recently created interpersonal relationships, it is found that the mix of media channels doesn't change significantly over time, except that the exchange of Short Text Messages declines. Again, this regularity is more pronounced for mixed pairs than for same-gendered (male or female) communicators. Regardless of gender, meeting frequency is less strongly related to Email and SMS exchanges when relationships exist longer than two years.
8) While to closeness of a relationship seems to be positively affected by the frequency of meetings and fixed phone calls, mobile contacts and Emails don't seem to make any consistent contribution. A substitutive relationship seems to hold among these two channels, because the effect of fixed phones is only significant when the frequency of physical encounters is low.

While such findings evidently rule out theoretical models of media substitution, they also contradict "additive models" which assume that the new digital media contribute to a linear increase in the amount and diversity of bilateral communication. Instead, they support "symbiotic" models which imply mutually reinforcing and self-amplifying causal effects between the different media channels. Thus, the microsocial impacts of mobile phones may be considerably deeper than generally expected, because they may contribute to more intensive face-

to-face gatherings as well as to new heights in the use of Email and conventional landline phones.
More detailed comparative as well as longitudinal studies will be needed to clarify these causal interactions and their joint impact on the quality of contemporary interpersonal relations.

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